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United States Department of Agriculture  
Agricultural Research Administration  
Bureau of Entomology and Plant Quarantine

## LABORATORY DUSTER

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A laboratory study of the effectiveness of insecticide dusts in killing Japanese beetles (Popillia japonica Newm.) involved designing a duster to meet the requirements of the tests. Briefly, it was necessary to distribute amounts ranging from 0.4 to 3.2 grams of dust in each of six cages approximately 3 by 6 by 3 feet. This paper describes the duster which was developed for this purpose.

## Description of Duster

The duster is shown in figure 1. A hose (A) connected with an air supply regulated at a pressure of 50 pounds per square inch is screwed into the inlet end of a lever-controlled spring valve (B) having a discharge orifice  $1/16$ -inch in diameter. A standard-pipe-size  $1/8$ -inch tee (C) is screwed onto the discharge end of valve B, so that the valve orifice is located at the center of the tee. A  $1/8$ - by 4-inch standard pipe nipple (D) is screwed into the tee outlet on the same axis as the valve. The small opening of a 60-degree funnel (E) having a top opening  $1\frac{1}{2}$  inches in diameter is fitted tightly into the third tee opening, which is directed vertically upward. All metal parts are of brass.

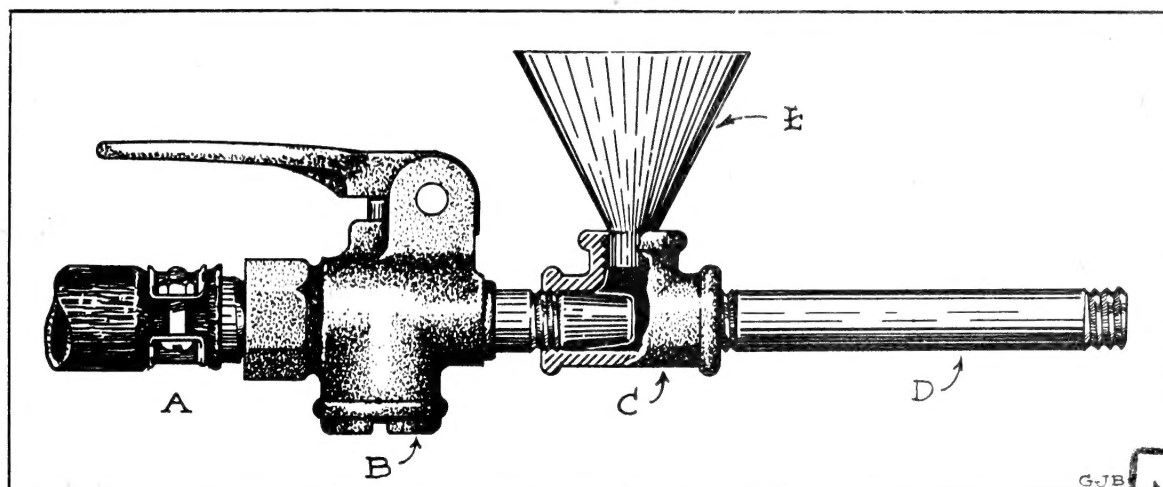
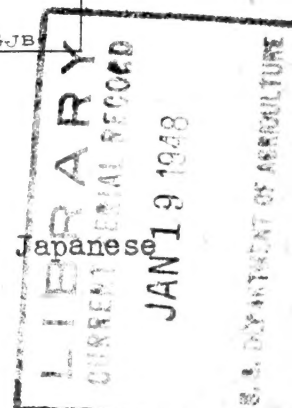


Figure 1.--Perspective drawing of duster.

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### Operation of Duster

The duster is operated by opening spring valve B, by depressing its lever, and then pouring the insecticide into funnel E. The high-velocity air stream released from the valve, acting on the principle of the air jet, causes the insecticide to be drawn from funnel E into tee C, and discharged from nipple D as a dust cloud. The entire operation requires about 1 second.

Doses ranging from 0.4 to 3.2 grams were divided in half, and the portions were distributed with a high degree of uniformity from each end of the test chambers. In preliminary tests it was found that dispersion of the insecticide, range of the dust cloud, and uniformity of the deposit were dependent upon the pressure of the air used and the length of the discharge nipple. The duster may be adapted to use on a larger scale by modification of these factors and the sizes of the parts.